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**DYE Precision, Inc.** U.S. Patent # 5,613,483. OTHER U.S. AND INT'L PATENTS PENDING.

Covered by one or more of the following U.S. Patents, 5,613,483; 5,881,707; 5,967,133; 6,035,843 and 6,474,326.



**RAIL**



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# RAIL™ OWNER'S MANUAL

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## INCLUDED WITH YOUR PROTO MATRIX RAIL™

- MATRIX Marker
- Allen tool set including 0.05", 1/16", 5/64",  
3/32", 1/8", 5/32", 3/16" and 1/4".
- 1/2 oz. DYE Slick Lube™
- Parts Kit
- Barrel Sock
- Owner's Manual
- Warranty Card
- 9V Battery

The RAIL™ comes with the tools required to perform general maintenance and setting up.

For a complete service the following tools are required

- 3/8" allen key
- 5/16" allen key
- #0 Phillips head screw driver
- A sharp pick to remove O-rings

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## WARNING

IMPORTANT SAFETY INSTRUCTIONS AND GUIDELINES

- The RAIL™ marker is not a toy. Misuse may cause serious injury or death.
- Please read, understand and follow the directions in the RAIL™ owner's manual.
- Eye protection that is designed specifically for paintball and meets ASTM/CE standards must be worn by user and persons within range.
- Recommend 18 years or older to purchase. Person under 18 must have adult supervision.
- Always treat the RAIL™ marker as if it were loaded and able to fire.
- Only use compressed air or nitrogen gas in the RAIL™ marker.  
DO NOT USE CO<sub>2</sub>.
- Do not exceed 850 psi input pressure.
- Only use .68 caliber paintballs that meet ASTM/CE standards.
- Ensure all air lines and fittings are tightened and secured before gassing up the RAIL™.
- Always chronograph the RAIL™ marker before playing paintball.
- Never shoot the RAIL™ marker at velocities in excess of 300 feet per second, or at velocities greater than local or national laws allow.



## WARNING

IMPORTANT SAFETY INSTRUCTIONS AND GUIDELINES

- Never look into the barrel or breech area of the RAIL™ when the marker is switched on and able to fire.
- Compressed gas is dangerous, do not allow compressed gas to come in contact with your skin or try to stop a leak by covering it with your hand.
- Always fit a barrel blocking device to your RAIL™ when not in use on the field of play.
- The owner's manual and any related warnings or instructions should always accompany the product for reference or in the event of resale and new ownership.
- Do not point the RAIL™ marker at anything that you do not intend to shoot.
- Do not shoot at people, animals, houses, cars or anything not related to the sport of paintball.
- Do not fire the RAIL™ without the bolt screwed in completely.
- If you read these instructions and do not fully understand them or are unsure of your ability to make necessary adjustments properly, call DYE Precision or your local pro shop for help.

# QUICK REFERENCE

## USING YOUR MARKER

### QUICK START UP GUIDE

Before playing with your new RAIL™ paintball marker there are a few important steps to take.

#### STEP 1. BATTERY INSTALLATION

- A. Remove three right hand side grip panel screws with a 3/32" allen key.
- B. Open grip panel and install 9V battery into the connector inside the frame.
- C. Close grip panel and tighten the three screws back. While closing the panel observe that no wires get caught between the frame and the grip panel.



#### STEP 2. BARREL INSTALLATION

- A. Screw on the barrel to the front of the RAIL™. Make sure it threads all the way in and tightens good.
- B. Attach the barrel sock so that it covers the tip of the barrel and secure the strap around the back of the RAIL™.



#### STEP 3. LOADER INSTALLATION

- A. Use the thumbscrew to tighten your loader into the adjustable feedneck on the RAIL™. For best performance you need a force feeding motorized loader, preferably the Rotor™ Loader. Loader should now be held in with a snug fit.

# QUICK REFERENCE

## USING YOUR MARKER

#### STEP 4. ATTACHING GAS SOURCE

- A. Screw in your air system to the ON/OFF airport and turn the knob of the airport clockwise, all the way in.

#### STEP 5. TURNING ON THE RAIL™ AND CHECKING THE VELOCITY

- A. Make sure you and everybody around you is wearing ASTM / CE approved paintball masks.
- B. Press and hold the top button located behind the grip frame until the RAIL™ turns on. **WARNING**, the RAIL™ is LIVE. Make sure barrel sock is in place and do not point the RAIL™ at anything you don't intend to shoot.
- C. Fill up the loader with .68 caliber paintballs.
- D. Shoot the RAIL™ over a chronograph to check the velocity. If adjustment is needed, adjust the velocity by turning the Hyper3™ velocity adjustment screw with a 3/16" allen key. In (clockwise) will reduce the velocity and out (counter clockwise) will increase the velocity. After each adjustment it takes a few shots before the change can be seen on the chronograph. Never adjust the RAIL™ to shoot faster than 300fps or what the field rules / local laws permit.

# RAIL™ BOARD

## SETTINGS AND FUNCTIONS



### TURNING THE RAIL™ ON AND OFF

To turn on the RAIL™, press and hold the power button until the LED's turn blue. The blue light indicates board boot up. After the boot up sequence, the LED's will turn either RED (no ball) or GREEN (ball ready to fire). To turn the RAIL™ off, press and hold the power button until the LED's turn off.

**NOTE:** The RAIL™ automatically switches off after 10 minutes of non-use.

### FIRING THE RAIL™

As soon as the marker is turned on and the LED's turn from blue to either red or green, the RAIL™ is ready to fire. If there is no ball and the LED's are RED, you need to hold the trigger for 1 second to force the RAIL™ to fire once. If there is a paintball inside the breech and the LED is green, just press the trigger to fire the marker.

### LED LIGHT INDICATOR

The RAIL™ uses two super bright LED's mounted on the circuit board inside the grip frame. These two lights are used to provide information to the user about the RAIL™. They will always show the same information and it does not matter which LED you look at. One is mounted behind the RAIL™ logo on the left side of the grip panel. The other one can be seen by looking at the top left side of the grip frame while holding the RAIL™ in the position you would while playing a game.

# RAIL™ BOARD

## SETTINGS AND FUNCTIONS

When you turn on the marker in normal operation mode with the power button, the light colors mean the following:

**Blue**

**Red**

**Green**

**Blinking Red**

**Blinking Green**

**Blinking Blue**

- Boot sequence
- Breech is clear, no ball detected inside the RAIL™ (eye is on)
- Ball in breech, ready to fire (eye on)
- Eye is turned off
- Eye failure, eye is blocked or dirty (see RAIL™ Eye, page 26)
- Indicates a low battery; battery should be changed as soon as possible



**NOTE: The eye is always activated when you turn the marker on.**

To turn off the eye feature press and hold the bottom button until the LED light starts blinking Red indicating the eye feature is turned off.



When servicing your marker:

- Make sure a barrel sock is fitted to the RAIL™.
- Make sure your hopper is removed from the RAIL™.
- Make sure there are no paintballs in the breech of the RAIL™.
- Always remove the first stage regulator and relieve all residual gas pressure from the RAIL™ before disassembly.
- The RAIL™ can hold a small residual charge of gas, typically 2 shots, with the first stage regulator removed. Always discharge the marker in a safe direction to relieve this residual gas pressure.

# RAIL™ BOARD SETTINGS AND FUNCTIONS



## BOARD SETTINGS AND CONFIGURATION MODE

There are five settings you can alter on the RAIL™ board with the DIP switches inside the grip frame (see figure 1):

**ABS**

Anti Bolt Stick.

**Trigger Sensitivity**

This setting adjusts the delay between two trigger pulls.

**Dwell**

This is the time the solenoid is activated for.

**Rate Of Fire**

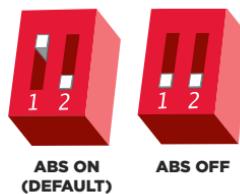
Rate Of Fire when the eye is deactivated.

**Firing Mode**

This is the firing mode the RAIL™ uses.

There are two DIP switches mounted on the board of the RAIL™ (See figure 1). The first one is used for the ABS setting and the second one is used to access a configuration mode which changes the other four settings.

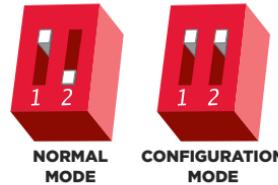
**Anti Bolt Stick** - When ABS is activated, the dwell is increased after 15 seconds of non-use for the next shot fired. This helps to prevent bolt-stick, but may result in higher velocity for the first shot.



# RAIL™ BOARD SETTINGS AND FUNCTIONS

**Configuration Mode** - The following settings can only be modified in configuration mode. To activate the configuration mode, turn your marker off and set DIP switch 2 to the ON position. Next, turn your marker on. The LED's cycle through all colors for one second to indicate that you have entered the configuration mode.

To cycle through different settings, pull and release the trigger. Configuration mode has 4 settings that can be changed.



## TO CHANGE A VALUE OF A SETTING

1. While in the configuration mode, choose the color you wish to change by pulling the trigger.
2. When the LED indicates the color you wish to change, pull and hold the trigger until the LED starts to flash.
3. The LED will flash as many times as the previous setting was and it will then turn off. Now pull the trigger as many times as you wish the new setting to be.
4. When done, the LED will cycle through all the colors again to indicate setting was saved and turn back to green. You can now change another setting or quit the configuration mode.
5. To exit configuration mode, set DIP 2 to the OFF position.



- The RAIL™ is not water resistant. Excess moisture can cause damage to electronic parts.
- Keep the board and all electrical components clean of dirt, paint and moisture.
- To clean the board, use canned air. If a more aggressive cleaning method is needed, lightly scrub the components with a soft, dry brush. Heavy scrubbing will damage the board.

# RAIL™ BOARD SETTINGS AND FUNCTIONS

## Green - Trigger Sensitivity



Values 1 - 20 (factory default 5)  
Trigger sensitivity is the amount of time that the trigger has to be released before the next trigger pull is allowed. In some situations with too low of a value, the RAIL™ can register more trigger pulls than what was actually pulled. This can cause the RAIL™ to shoot full auto, even in semi-automatic mode. To fix this, adjust the trigger sensitivity setting higher.

## Red - Dwell



Values 1 - 30 (factory default 18)  
Dwell is the amount of time that the solenoid will be activated.

Follow these steps for the best way to set your dwell:

- Remove loader and any paintballs from the RAIL™ marker.
- With the dwell set at 10, start increasing the value until the marker begins to fire.
- When you reach the setting where the marker begins to fire, get some paint and a loader and go to a chronograph.
- Increase the dwell until you see no increase in the velocity.  
This is the optimal dwell setting to be used.

**NOTE: You cannot turn your marker off with the power button when the marker is in configuration mode. You must first set DIP switch 2 to the OFF position.**

# RAIL™ BOARD SETTINGS AND FUNCTIONS

## Blue - Rate Of Fire (ROF)



## Blue - Rate Of Fire (ROF)

Values 1 - 45 (factory default 12.5 bps)  
The ROF setting is used to set the maximum rate of fire of the RAIL™. The values do not correspond directly to a certain Balls Per Second (BPS) value. You will need to use the table below to locate your desired maximum ROF setting.

The factory setting is **20 (12.5 bps)**.

<b>1</b>	9.80	BPS	<b>10</b>	10.75	BPS	<b>19</b>	12.34	BPS	<b>28</b>	13.88	BPS	<b>37</b>	15.87	BPS
<b>2</b>	9.90	BPS	<b>11</b>	10.86	BPS	<b>20</b>	<b>12.50</b>	BPS	<b>29</b>	14.08	BPS	<b>38</b>	16.12	BPS
<b>3</b>	10.0	BPS	<b>12</b>	10.98	BPS	<b>21</b>	12.65	BPS	<b>30</b>	14.28	BPS	<b>39</b>	16.39	BPS
<b>4</b>	10.10	BPS	<b>13</b>	11.11	BPS	<b>22</b>	12.82	BPS	<b>31</b>	14.49	BPS	<b>40</b>	16.66	BPS
<b>5</b>	10.20	BPS	<b>14</b>	11.62	BPS	<b>23</b>	12.98	BPS	<b>32</b>	14.70	BPS	<b>41</b>	20.0	BPS
<b>6</b>	10.30	BPS	<b>15</b>	11.76	BPS	<b>24</b>	13.15	BPS	<b>33</b>	14.92	BPS	<b>42</b>	22.22	BPS
<b>7</b>	10.41	BPS	<b>16</b>	11.90	BPS	<b>25</b>	13.33	BPS	<b>34</b>	15.15	BPS	<b>43</b>	25.0	BPS
<b>8</b>	10.52	BPS	<b>17</b>	12.04	BPS	<b>26</b>	13.51	BPS	<b>35</b>	15.38	BPS	<b>44</b>	28.57	BPS
<b>9</b>	10.63	BPS	<b>18</b>	12.19	BPS	<b>27</b>	13.69	BPS	<b>36</b>	15.62	BPS	<b>45</b>	33.33	BPS

Increasing ROF too high will increase probability of ball breakage.  
If this occurs decrease ROF setting.

## Yellow - Firing Mode



## Yellow - Firing Mode

Values 1 - 4 (default 1)  
This setting changes the firing mode of the RAIL™. Default is semiautomatic. In the semiautomatic mode, one trigger pull shoots out one paintball. The PSP mode and the Millennium mode follow the rules of the paintball tournament series.

- Value 1** - Semi-automatic Mode
- Value 2** - Millennium Mode
- Value 3** - PSP Mode
- Value 4** - Full Auto

## RAIL™ BOARD SETTINGS AND FUNCTIONS



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## RAIL™ BOARD SETTINGS AND FUNCTIONS

### BATTERY

The 9V battery will last for about 40,000 shots. Please be aware that there are substantial differences in performance between different brands of batteries. Use of high quality alkaline or lithium ion batteries is recommended for maximum battery life. If you plan not to use your marker for a long period of time (a month), it is recommended that you remove the battery from the marker. When the battery voltage starts to go too low, the marker will not fire with every trigger pull. For tournament use, it is recommended to change the battery for each tournament.

### CHANGING THE BATTERY

The battery is housed on the right side of the grip frame. To access the battery, remove the three screws holding the right side grip panel down. Use a  $\frac{3}{32}$ " allen key. When inserting a new battery notice the + and - marks on the board. The positive lead of the 9V battery goes to the left and the negative lead to the right.

**NOTE:** If the marker will not function with the eye on, there is a good chance the battery needs to be changed.



- A low battery will not be able to power both the ACE eye and the trigger switch, causing ACE eye failure.
- If the battery is low, the marker will not fire with every trigger pull.

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# TRIGGER ADJUSTMENT

# TRIGGER ADJUSTMENT

FIGURE 1



## ADJUSTING YOUR TRIGGER

The trigger's forward travel, over travel and spring tension are fully adjustable so that the user can fine-tune the trigger to his or her exact liking. You do not need to remove the frame from the gun in order to adjust the trigger pull.

There is one adjustment screw located on the right side of the Ultralite frame behind the sticky grip, one adjustment screw located in the top of the trigger, and one adjustment screw behind the trigger.

The adjustment screw on the right side of the frame adjusts the over travel of the trigger. The adjustment screw in the top of the trigger adjusts the forward travel of the trigger. The screw located behind the trigger is used to change the tension of the trigger spring.

## TO ADJUST TRIGGER TRAVEL (SEE FIGURE 1)

- The screw in the top of the trigger (1) controls the forward travel. Screwing it in will shorten the trigger's length of pull. Use a .50" allen key to adjust this screw.

**NOTE:** If this screw is adjusted too far, the switch will be held down at all times and the marker will not fire.

- The screw on the right side of the frame (2) controls the over travel. By turning this screw you can adjust how far the trigger will travel after it reaches the firing point. Use a 5/64" allen key to make the desired adjustment.

**NOTE:** If this screw is adjusted too far, the trigger will not be allowed to travel far enough to depress the switch and fire the marker.

## TO ADJUST SPRING TENSION (SEE FIGURE 1)

- The adjustment is made by pushing the allen key through a hole in the trigger (3). Use a 5/64" allen key to make the desired adjustment.

To make the trigger pull stiffer, turn the allen key clockwise or in.

To make the trigger pull lighter, turn the allen key counterclockwise or out.



- Be sure the trigger is not adjusted to the point where it is too sensitive and may cause accidental discharge of the marker.
- Removing the trigger spring will cause premature wear on the microswitch, resulting in failure.
- Be sure you do not pinch the wires between the frame and body when reattaching the frame to the body.**

## RAIL™ BOLT ASSEMBLY AND MAINTENANCE



The RAIL™ BOLT is the main component of the RAIL™ marker. In order to achieve the best possible performance of the RAIL™ it is essential that the RAIL™ BOLT is kept clean, well lubed and in good working order.

The RAIL™ BOLT should be cleaned and re-lubed every 10,000 shots or after breaking paint or playing in severe conditions.

There are 4 parts in the RAIL™ BOLT kit that mount together as one unit. To remove the RAIL™ BOLT from your RAIL™, use a 1/4" allen key and turn the Back Cap out 1½ - 2 turns. Now pull out the complete RAIL™ bolt kit from the RAIL™.

To dis-assemble you unthread the front most part called the Can and the Manifold from each other. Then pull out the actual moving bolt from inside these pieces. Notice that to remove the Can you need to remove the bolt tip O-ring before the bolt is able to slide through the Can.



FORWARD POSITION



BACK POSITION

### HOW DOES IT WORK

Air is supplied into two points on the RAIL™ BOLT. In the back air is routed through the Manifold and fills up the supply chamber around the Manifold. In the front air is routed through the solenoid into the Can. This air pushes against the Sail on the Bolt which keeps the bolt in the back position.

## RAIL™ BOLT ASSEMBLY AND MAINTENANCE



When the RAIL™ is fired the solenoid is actuated and the air inside the Can is exhausted out. This causes the Bolt to start moving forward with the force created by the air inside the supply chamber. Once the bolt has moved about half way forward, the input into the supply chamber is closed and a patent pending Boost™ feature is activated on the Back. This gives the Bolt an extra push forward and makes sure the valve of the RAIL™ is opened fast and efficiently. The secondary benefit of this Boost™ feature is that on the initial part of the Bolt movement, the Bolt pushes very gently against the paintball inside the breech reducing ball breakage.

Once the Bolt reaches the forward point, the valve of the RAIL™ Bolt is opened and air inside the supply chamber goes through the Bolt and fires the paintball. After this the solenoid is deactivated and gas is supplied through the solenoid back into the Can. This causes the Bolt to return to the back position and the supply chamber to be re-charged. Notice that when the Bolt moves to the back position a small amount of gas used for the Boost™ feature is leaked out through the Back Cap.



When servicing your marker:

- Make sure your hopper is removed from the marker.
- Make sure there are no paintballs in the breech of the marker.
- Always remove the air supply and relieve all gas pressure in the marker before disassembly.
- When using the marker in temperatures below 50° Fahrenheit it may be necessary to lube the RAIL™ bolt more frequently.

## RAIL™ BOLT ASSEMBLY AND MAINTENANCE

### MAINTENANCE

The basic maintenance for the RAIL™ BOLT is to clean all surfaces of dirt, broken paint or other debris, check for any wear and tear on the O-rings and changing them if needed, and finally applying a thin coat of DYE Slick Lube on all surfaces. Before installing the RAIL™ BOLT back to the RAIL™ marker check that the bolt moves freely without a lot of friction.



Before installing the RAIL™ BOLT back into the RAIL™ make sure all pieces are threaded together snugly!

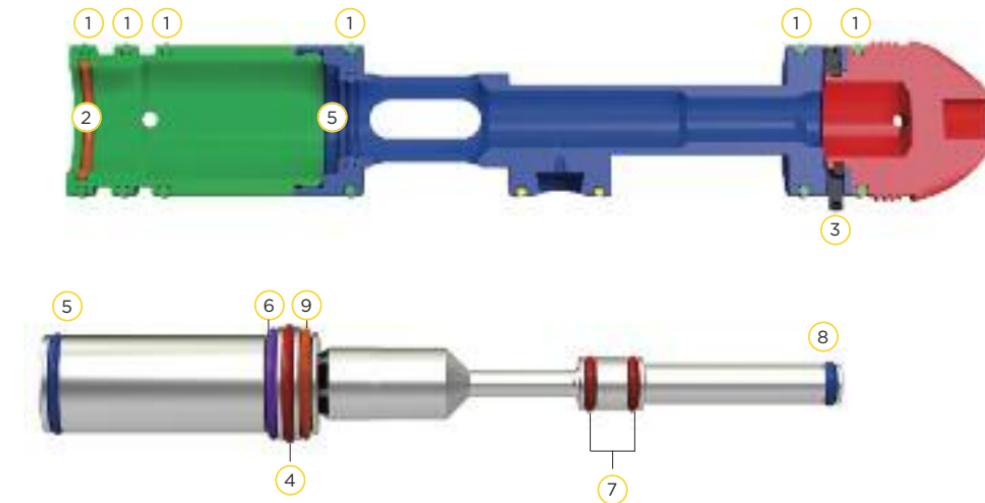
If the RAIL™ BOLT is not kept clean and well lubed, you will either start seeing erratic velocity, leaks or over long period of time, physical damage to the RAIL™ BOLT components.

Notice that it's normal for a small amount of gas to come out through the back cap when the RAIL™ is fired. This gas is used for the Patented Boost™ forward technology of the RAIL™.

For troubleshooting leaks and other bolt problems, consult the troubleshooting section at the end of this manual.



## RAIL™ BOLT ASSEMBLY AND MAINTENANCE



### RAIL™ BOLT O-RING LIST

1	020	BN 70	6	015	BN 90
2	017	BN 70	7	009	BN 70
3	016	BN 70	8	007	BN 70
4	015	BN 70	9	014x2	BN 90
5	014	BN 70			

## LOADERS AND FEED NECK

### LOADERS AND FEED NECK

To achieve the maximum performance of the RAIL™ you will need to use a motorized loader that force feeds paintballs into the RAIL™ marker, preferably the Rotor™ Loader. Using a slower motorized loader or a non-motorized loader will work, but the rate of fire and performance will be reduced.

To fit a loader onto the RAIL™:

1. Loosen the feed neck adjustment thumb screw.
2. Push the loader all the way into the feed neck.
3. Tighten the feed neck adjustment screw until loader is secure. Note that using too much force tightening the screw could cause damage to your loader.

Loader should now be held in with a snug fit.

There is no maintenance needed for the feed neck besides keeping it clean of broken paint, dirt and debris.

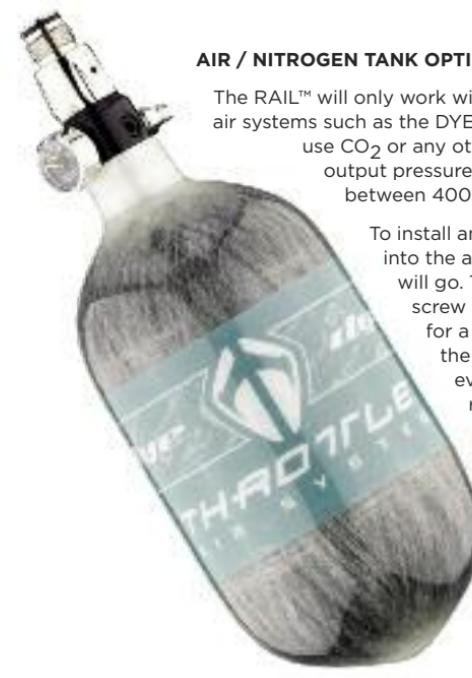


## AIR/NITROGEN

### AIR / NITROGEN TANK OPTIONS AND INSTALLATION

The RAIL™ will only work with Compressed air or Nitrogen air systems such as the DYE Throttle air system. Do not use CO<sub>2</sub> or any other compressed gas. The output pressure from the air system has to be between 400 - 850psi.

To install an air system, screw the tank into the airport all the way as far as it will go. To remove the air system screw out. There will be gas leaking for a few seconds while you screw the air system out. Notice that even with the air system removed there can be gas inside the RAIL™ and it can still fire a paintball. Always treat the marker as being live and never point it to anything you don't intend to shoot at!



## AIRPORT ASSEMBLY AND MAINTENANCE



### AIRPORT ADJUSTMENT AND MAINTENANCE

The location of the airport adapter can be moved approximately 1 $\frac{1}{4}$ " back or forward from the stock position to fit your individual preference.

The Ultralite frame comes equipped with an integrated locking dovetail. There is a locking screw located on the bottom right side of the Ultralite

frame. It can be accessed with a 1/8" allen key through a hole in the grip panel. To unlock a part attached to the dovetail of the frame, turn the locking screw counterclockwise one full turn and slide the part off the dovetail. To attach a part to the dovetail, slide the part on and turn the locking screw clockwise until part is firmly locked in place.



## ON/OFF AIRPORT ASSEMBLY AND MAINTENANCE

### ON/OFF AIRPORT

The RAIL™ comes equipped with an On/Off Airport attached to the bottom of the frame. To turn on the gas supply, twist the ON/OFF knob clockwise, all the way in. To turn off the gas supply, twist the ON/OFF knob counterclockwise, all the way out. As you turn the knob out, the residual gas between the Hyper3™ and the ON/OFF airport is vented.

When screwing the air system into the airport, always check that the threads on the air system and the airport are clean and not worn out. If you think the threads are not in good condition, contact DYE Precision or a professional store before screwing in the air system.

## HYPER3™ IN-LINE REGULATOR ADJUSTMENTS AND MAINTENANCE



### VELOCITY ADJUSTMENT

The velocity of the RAIL™ is adjusted by adjusting the input pressure into the RAIL™. This is controlled with the Hyper3™ regulator. The Hyper3™ on the RAIL™ is factory set to 145 psi which will give you a velocity of about 285 FPS (Feet per Second). A  $\frac{3}{16}$ " allen key will be needed for this operation. Turning the adjustment screw in (clockwise) will decrease the pressure, and out (counterclockwise) will increase the pressure. To adjust the velocity:

1. Make sure you and everybody around you is wearing ASTM/CE approved paintball goggles.
2. Shoot the RAIL™ over a paintball chronograph.
3. To lower the velocity turn the Hyper3™ adjustment screw in. To increase the velocity turn the screw out. Only turn the screw a quarter turn at a time and shoot over the chronograph again. Notice that a few shots are needed before the change can be seen on the chronograph.

### MAINTENANCE

For the RAIL™ to function properly, it is essential that the input pressure into the marker stays consistent at all times. The general maintenance needed for the Hyper3™ regulator is to keep it clean of dirt and debris at all times. A more extensive service should be performed every 12 months by a trained Tech or if the output pressure of the regulator doesn't stay consistent. This can be seen as inconsistent velocity and verified with a regulator tester (sold separately). Notice that the Hyper3™ has a break in period of about 2000 shots before it achieves the best performance.

## HYPER3™ IN-LINE REGULATOR ADJUSTMENTS AND MAINTENANCE

### HYPER3™ REGULATOR DIS-ASSEMBLY INSTRUCTIONS

To disassemble the Hyper3™ regulator you will need a  $\frac{3}{16}$ " allen key and a  $\frac{5}{16}$ " allen key. Place the  $\frac{3}{16}$ " allen key inside the top cap and the  $\frac{5}{16}$ " allen key inside the bottom cap. Unscrew the bottom cap from the Hyper3 body.

Next unscrew the brass seat housing from the body with a  $\frac{3}{16}$ " allen key. Slide the swivel from the body.

To change the seat, pull out the old seat from the housing with a sharp object. Insert the new seat in place and push it down with a flat object. Notice that it takes about 2000 shots for the seat to perfectly sit into the seat housing. This is called the break in period for the regulator.

Remember to apply lube to the 010 and 013's in the regulator before re-assembly.

Further disassembly to service the top section of the Hyper3™ should be performed by a trained Tech.



## ANTI CHOP EYES/ BALL DETENTS

### MAINTENANCE AND CHANGING

#### ANTI CHOP EYES

The Anti Chop Eye (ACE) system will prevent the RAIL™ from chopping paint by not allowing the marker to fire until a ball is fully seated in front of the bolt. The eyes use a beam across the breech. On one side there is a transmitter, and on the opposite side a receiver. In order for the marker to fire with the eyes turned on, the signal between the two eyes must be broken. After every shot, before the next ball drops in the breech, the eye transmitter and receiver must see each other. If the eyes are dirty and cannot see each other between shots, the LED on the board will start blinking green. This means that the eyes are dirty. This is an extremely reliable system as long as the eyes are kept clean. The most common reason for dirty eyes is broken paint. If the eyes become dirty, the marker will default to a reduced rate of fire to prevent chopping. If this happens during game play, you can bypass this by turning the eyes off. Clean the eyes as soon as possible.

**NOTE: IF THE BATTERY IS LOW, THE MARKER MAY ACT AS IF THE EYES ARE DIRTY OR NOT FIRE AT ALL. IN THIS CASE, REPLACE THE BATTERY.**



## ANTI CHOP EYES/ BALL DETENTS

### MAINTENANCE AND CHANGING

#### CLEANING THE ANTI CHOP EYES

Quite often, just cleaning the breech out with a swab will clean the eyes well enough for them to read one another. For a thorough cleaning, the best method is to use air. Using an air hose or canned air (typically used for dusting keyboards) works best.

Blow the eyes clean from inside the breech. If you feel the eyes still need a more detailed cleaning, remove the eye cover to gain full access to the eyes.

To remove the eye cover, you will need a 1/16" allen key, take caution not to lose the detent spring when removing the eyeplate.

**NOTE:** Regular eye cleaning is recommended even if no paint is broken. Clean the eyes every two months or 10,000 shots to eliminate any built up dirt. Excess grease from the front bolt O-ring can build up in front of the eyes. Remember to check for this after greasing the bolt and cycling the marker a few times.

#### CHANGING BALL DETENTS

The ball detent system is also located under the eye covers. The ball detent system needs little or no maintenance. There is a spring behind each detent, which holds the detent forward. This spring pressure should be easily overcome with very little force, such as a paintball moving past. If you are experiencing double feeding or chopping, check the condition of your ball detents with your finger to make sure they are not stuck in the up or down position and that they move in and out of the breech freely. If excessive broken paint or dirt has jammed your ball detents, remove the eye plates (being careful not to lose the detent springs) and pull the detents out for a thorough cleaning. Reinstall the detents, springs and eye covers after you have sufficiently cleaned the detents and breech.

**NOTE: TAKE CARE WHEN REPLACING THE EYE COVER. OVER-TIGHTENING THE RETAINING SCREW COULD RESULT IN STRIPPING THE THREADS.**

# TROUBLE SHOOTING GUIDE

## AIR LEAKS

### AIR LEAKING FROM THE AIRPORT

- Check the o-ring on the air system. If needed change the O-ring and try again. The O-ring normally used is #15 but some manufacturers might use a different size. Consult the manual of the air system you are using.
- Check that the hose connector is tight. Remove the hose from the connector by pushing the floating ring towards the connector and pull out hose. Use a 7/16" allen key to tighten. If needed remove and apply thread sealant to the thread and re-tighten. If unsure consult expert advice.
- Check that the end of the hose is cut straight and is not worn out. If needed cut a small piece off the hose with a razor blade and re-insert hose into the fitting.  
Make sure hose goes all the way to the end.

### AIR LEAKING FROM THE HYPER3™ REGULATOR

- First locate the position of the leak.
- For disassembly instructions consult the technical section under Hyper3™ regulator.
- If the leak is coming from the bottom of the regulator you will need to disassemble the regulator and change the #010 O-ring and the seat on the brass seat retainer mounted inside the Hyper3™ regulator.
- If the leak is coming from the swivel piece

where the hose connector mounts, you will need to change the two #013 O-rings under the swivel piece or tighten the hose connector.

- If the leak comes from the small hole in the middle of the regulator there are two possible O-rings. Change the #015 O-ring on the piston and the #007 urethane O-ring inside the body of the regulator.
- If the leak is from the top of the regulator change the #012 O-ring on the outside of the cap.

### AIR LEAKING FROM THE ASA

- First make sure that the ASA is tightened well into the body of the RAIL™ by removing the Hyper3™ regulator and tightening the ASA with a 3/16" allen key.
- Next change the #012 O-ring on the top cap of the Hyper3™ and apply a small amount of lube to the O-ring.
- Finally, if above steps don't help, remove the ASA with a 3/16" allen key and change the #012 O-ring mounted on the top of the ASA. Apply a small amount of lube and tighten back together.

### AIR LEAKING BETWEEN BODY AND FRAME

- A leak between the body and the frame can be caused by a couple of things.
- First pull out the Bolt kit and change the #015 sail O-ring and the three #020 O-rings on the outside of the Can.

# TROUBLE SHOOTING GUIDE

## AIR LEAKING FROM FRONT OF THE RAIL™

- Remove the Bolt kit from the marker and change the #017 O-ring located inside of the Can and the #014 O-ring located inside the Manifold. Lube well and re-assemble.
- If above doesn't help, try changing the #020 O-rings located outside of the Can. Lube well before re-inserting bolt kit.

## PROBLEMS WITH ELECTRONICS

### RAIL™ WON'T TURN ON

- Make sure battery is new and well charged.
- Check that battery is connected to the 9V clip inside the RAIL™.
- Make sure there is no dirt or debris blocking the button from being pressed.

### RAIL™ WILL TURN ON / OFF BY ITSELF OR THE EYES WILL TURN ON / OFF BY THEMSELVES

- Both of these problems are caused because the button(s) are pressed all the time.
- Remove board from the frame by removing the grip panel on the left hand side, disconnecting the cables and pulling the board out. Carefully remove the two buttons and clean them well.
- Re-assemble and test. If problems persist, contact authorized service center for board replacement.

# TROUBLE SHOOTING GUIDE

## EYES WILL NOT WORK, LED KEEPS BLINKING GREEN

- First change the battery. The eyes are normally the first thing to stop working when a battery is dying.
- Next try to clean the eyes. You can either use canned air and blow out the eye holes through the feed neck hole. Or remove the eye plates with a 1/16" allen key, pull out the eyes from the mounting holes carefully and clean them with q-tips. To test if the eyes work make sure there is nothing inside the breech and that the bolt is in the back position. Turn on the RAIL™, the light should be red after the boot up sequence. If it is, the eyes are working.
- Check that the eye wire is connected to the board so that metal clips are facing down.
- If nothing above helps contact a store or DYE Precision for eye replacement.

## SOLENOID WILL NOT ACTIVATE / TRIGGER NOT WORKING

- Check that the trigger adjustment is not set so that the micro switch cannot activate. You should hear a small click when pulling the trigger.
- If the RAIL™ fires once when turned on but not after that your trigger is set so that the micro switch is always activated. Re-adjust the trigger.
- If the trigger is correctly adjusted but the RAIL™ still won't fire, check that the micro

switch cable is well inserted into the board and to the correct connector (the micro switch connector is marked with the text "SW1" on the board).

- Change the battery if not positive about its charge.
- Check that the solenoid cable is attached to the board and to the right connector (solenoid should be attached to the connector that is marked with the text "SOL").

## TRIGGER BOUNCE / RAIL™ SHOOTING MORE THAN ONE BALL PER PULL IN SEMI AUTOMATIC MODE

- Raise the trigger sensitivity level in the configuration mode.
- Check that the trigger is not adjusted too short.
- Make sure there is a trigger spring inside the frame.

## ERRATIC VELOCITY/RAIL™ WON'T FIRE

### RAIL™ FIRES BUT BALLS ARE DROPPING OFF OR NOT EVEN COMING OUT OF THE BARREL

- Make sure the battery is good.
- Raise the dwell to factory level (18).
- Make sure bolt is well lubed and moves well. If there is too much friction in the Bolt, it will cause the RAIL™ to shoot down.
- Make sure air system is screwed in all the way.

# TROUBLE SHOOTING GUIDE

## FIRST SHOT IS TOO HIGH

- Change the Seat inside the Hyper3™ regulator. For disassembly instructions consult the technical section.
- Check that the #013 O-ring on the outside of the Manifold is in place and in good condition.
- Try turning off the ABS feature by turning DIP #1 to the off position.

## VELOCITY IS NOT CONSISTENT

- Make sure the paintballs you are using fit the barrel good and are consistent in size. The stock barrel with the RAIL™ is .690 size. You should be able to blow the paintball through the barrel but they should not roll through the barrel on their own.
- Remove the bolt kit and re-lube it. Change any O-rings causing a lot of friction. Make sure #014 O-ring in bolt tip is in place and in good condition.
- Raise the dwell.
- Change the battery.
- Check that the Hyper3™ regulator is working good and that the pressure is consistent. A separate regulator testing tool is available for this. If needed, disassemble and change worn out O-rings in the Hyper3™ regulator.

## OTHER CATEGORIES DOUBLE FEEDING

- If you get two balls firing at once change the ball detents by removing the eye plates, taking out the old ball detents and inserting new ones.

## BREAKING PAINT

- Make sure you use high quality paintballs and that they are stored according to the manufacturers instructions.
- Check that #14 O-ring on bolt tip is in place and in good condition.
- Make sure your loader is working good and that the rate of fire is not set higher than the maximum feed rate of the loader.
- Check that the barrel you are using is not too tight for the paintballs you are using.
- Check the condition of the ball detents.



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## EXPLODED VIEW

# RAIL™ WARRANTY INFORMATION

## WARRANTY AND LEGAL INFORMATION

### PARTS LIST

- 1 Clamping Feed Collar
- 2 Feed Neck Knob
- 3 Feed Neck
- 4 Ball Detent
- 5 Eye Cover
- 6 Hyper3™
- 7 "ACE" Eye
- 8 Solenoid
- 9 Front Frame Screw
- 10 Ultralite Frame
- 11 Rear Frame Screw
- 12 RAIL™ Bolt
- 13 RAIL™ Body
- 14 Eye Cover Screw
- 15 Airport
- 16 ASA
- 17 Solenoid screws

### WARRANTY

DYE Precision, Inc. warrants for one year to the initial retail purchaser, from the initial date of purchase, that the paintball marker and regulator are free from defects in materials and workmanship, subject to the requirements, disclaimers and limitations of this warranty. Disposable parts, normal maintenance and standard wear and tear parts such as batteries, O-rings and seals are not covered under warranty. The solenoid and electronic components on the marker are covered under warranty for six months. This warranty does not cover scratches, nicks, improper disassembly, improper re-assembly, misuse, neglect or improper storage. Modification to the product will void the warranty. The only authorized lubricant for the marker is Slick Lube™. Use of any other lubricant will void your warranty. This warranty is limited to repair or replacement of defective parts with the customer to pay shipping costs. Warranty card and proof of purchase must be submitted to DYE Precision for warranty to be in effect. This warranty is not transferable. This warranty does not cover performance. Paintball markers are non-refundable.

### TECHNICAL SUPPORT

Our Technical Support Departments are open Monday through Friday.  
DYE Precision, Inc. can be reached at 858-536-5183 ext.277 from 9am to 5pm PST.  
DYE Europe can be reached at +44 (0) 20-8649-6330 from 9am to 5pm GMT.  
DYE Asia can be reached at 886 (0) 4-2407-9135 from 9am to 5pm GMT +8 hours.  
Additional support and international contacts are available through our web site, [www.dypepaintball.com](http://www.dypepaintball.com).

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